WEATHER OF NORTH AMERICA AND ADJACENT OCEANS.

NORTH ATLANTIC OCEAN.

By F. A. YOUNG.

The average pressure for the month was considerably above the normal at land stations on the west coast of Newfoundland and in eastern Canada, as well as in the Azores, Bermudas, and British Isles; it was slightly lower than usual at St. Johns, Newfoundland, and in the West Indies, while the departures were small on the Atlantic and Gulf coasts of the United States.

The number of days on which fog was observed was apparently somewhat greater than usual over the banks of Newfoundland; fog was also reported frequently over the mid-section of the steamer lanes, but was comparatively rare off the coast of Europe.

With the exception of July, June is ordinarily the quietest month of the year on the North Atlantic, and during the month under discussion the days on which winds of gale force were reported were even less than usual. While a few cyclonic disturbances occurred, they were, as a rule, of limited intensity and extent.

From the 1st to the 4th high pressure with light to moderate winds was the rule over the entire ocean, while fog prevailed over the Grand Banks.

On the 5th and 6th conditions were about the same as far as pressure, wind, and fog were concerned, except that the British S. S. *Hartington*, while in the region between the Azores and the Spanish coast, encountered a northerly gale with barometic readings of over 30 inches. No storm logs from other vessels were received, and craft in the vicinity reported winds with a force of from 4 to 6 at the Greenwich mean noon observations taken on these dates.

Report follows:

June 5, moderate gale, light NE. swell. Overcast with heavy rain at times. June 6, moderate gale, high sea, and NE. swell. Overcast with heavy rain. Position: Greenwich mean noon on the 6th, latitude 42° N., longitude 18° W.

From the 7th to the 10th there ensued another comparatively quiet period, with fog over the Grand Banks.

From the 11th to the 13th there was a fairly well-developed area of low pressure central near St. Johns, Newfoundland. This was practically the only disturbance of any consequence during June and was of limited intensity and extent. Later in the month, however, a few storm-logs were received from vessels in widely scattered localities. On the 12th and 13th comparatively heavy weather prevailed over the region between the 35th and 42d parallels and the 47th and 57th meridians. On the former date one vessel in the middle section of the steamer lanes encountered winds of gale force after the time of Greenwich mean noon observation. Storm-logs follow:

American S. S. *Dallas:*

Gale began on the 11th; wind SW. Lowest barometer 29.88 inches at 11 p. m. on the 11th; wind SW., 6, in latitude 41° 29′ N., longitude 50° 42′ W. End on the 12th; wind SW. Highest force of wind, 8; steady from the SW. Barometer rising throughout.

British S. S. *Venturia:*

Gale began on the 12th; wind ESE. Lowest barometer 30.05 inches at 10 p. m. on the 12th; wind S., 7, in latitude 50° 11′ N., longitude 34° 52′ W. End on the 13th; wind SW. Highest force of wind 8, S. by E.; shifts S.–SW.

American S. S. *Independence Hall:*

Gale began on the 12th; wind SW. Lowest barometer 29.97 inches at 6 a. m. on the 12th; wind SW., 7, in latitude 40° 30′ N., longitude 49° 20′ W. End on the 13th; wind SW. Highest force of wind 8, SW.; steady from SW.

American S. S. *Conness Peak:*

Gale began on the 12th; wind SSW. Lowest barometer 29.83 inches at noon on the 12th; wind SSW., 7, in latitude 38° 31′ N., longitude 55° 42′ W. End on the 13th; wind SSW. Highest force of wind 8, SSW.; steady from SSW.

From the 14th to the 16th moderate weather was the rule. On the former date fog was observed in mid-ocean. Conditions had not changed materially by the 17th, except that moderate northwesterly gales were reported at Malin Head, Ireland, and also by the British S. S. *Gloria de Larrinaga*, which on that date was about 250 miles west of the coast of Scotland. Storm-log:

Gale began on the 16th; wind W. Lowest barometer 29.90 inches on the 19th; wind NW., in latitude 55° N., longitude 24° 30′ W. End on the 20th; wind W. Highest force of wind 9; shifts W.–NW.

On the 19th the American S. S. *Dallas* encountered a moderate westerly gale in the same region, although other vessels near by experienced only light to moderate winds. Storm-log:

Gale began on the 18th; wind NW. Lowest barometer 29.90 inches at 1 p. m. on the 19th, wind W., 6, in latitude 58° 09′ N., longitude 17° 01′ W. End on the 19th; wind W. Highest force 8; steady from W. Barometer falling throughout.

From the 20th to the 29th, the usual stagnant atmospheric conditions prevailed over practically the entire ocean, and the American S. S. *Tripp* was the only vessel to render a storm-log during that period, as follows:

From noon to midnight on the 23d moderate southerly gale, near latitude 38° N., longitude 63° W. Highest force of wind 8, S.

A rather unusual case of abnormal refraction was reported from the British S. S. *Cadillac* as follows:

June 26 and 27 abnormal refraction observed. Observation at morning and evening twilight (stars) differing from day (sun) observation by from 12 to 17 miles. No appreciable difference between sea and air temperatures, or barometric changes. Greenwich mean noon position on the 26th; latitude 40° 09′ N., longitude 64° 25′ W.

On the 30th there was apparently a fairly well-developed area of low pressure over the eastern part of the steamer lanes, although not enough observations have been received for an accurate determination of its extent or position. Storm-logs follow:

British S. S. *Bristol City:*

Gale began on the 29th; wind SSW. Lowest barometer 30 inches at 3 a. m. on the 30th; wind W., S, in latitude 47° 30′ N., longitude 33° W. End on the 30th; wind NW. Highest force of wind 8; shifts W.–NW.

American S. S. *St. Paul:*

Gale began on the 30th; wind SW. Lowest barometer 29.80 inches at midnight on the 30th; wind SW., 8, in latitude 48° 19′ N., longitude 20° 25′ W. End on July 1; wind NW. Highest force of wind 8; shifts SW.–W.–NW.

NORTH PACIFIC OCEAN.

By WILLIS E. HURD.

It is the usual expression that June is a quiet month over the North Atlantic and the North Pacific Oceans. The reports from the North Atlantic indicate few atmospheric disturbances during June, 1922, and those from the North Pacific, except perhaps from the Far East, are almost equally as assertive of quiet conditions. The chief officer of the Norwegian S. S. *Hanna Nielsen*, bound from Tsingtau, China, to Astoria, Oregon, from May 27 to June 13, thus tersely remarked: "Unusual calm sea and weather, except the days with fog, all the way over."

Aside from the generally calm seas and quiet weather the appearance of fog was most frequently noted by shipping. East of the 180th meridian fog occurred during the first six or eight days of the month over the northern routes and sporadically thereafter at least until the 18th. West of the 180th meridian, fully 40 per cent of the observers reported fog during the early half of June, and several reported it practically throughout the remainder of the month.

Pressure changes, except in the typhoon region and thence over the Aleutians and eastward, were moderate. At Honolulu the absolute range of pressure was only 0.25 inch. Here unusually cloudy conditions prevailed, with the lowest percentage of sunshine in 18 years of record. It was also the calmest June on record.

The eastern North Pacific high-pressure area did not assume control of weather conditions until the 10th. Previously a shallow but well-defined low-pressure area had hung off the American coast. After the 16th another shallow depression nosed its way into the high-pressure area from the westward completely severing it from about mid-ocean to British Columbia until about the 19th. Owing to these and other changes, the average pressure over much of this region was below normal.

The Aleutian low-pressure area was especially prominent from the 7th to the 9th and from the 20th to the 24th; and was again assuming energetic indications on the 30th. The circulation over this area was weak, however, and no gales of consequence seem to have occurred.

In Mexican and Central American waters conditions were reported quiet except for a gale to the southward of Salina Cruz on the night of the 3d, due to the oncoming summer conditions peculiar to this locality at the beginning of the rainy season.

In the Far East reports received up to the 17th of the month show five cyclones passing near or over Japan. Of these two were of continental origin, giving moderate to strong gales; two were semi-tropical depressions; and the fifth, a storm which persisted from the 8th to the 11th of the month, was a typhoon of considerable intensity. The typhoon originated to the northwestward of Luzon, moved northeastward, and disappeared at sea to the eastward of Japan. The Yellow Sea depression of the 15th–17th seems to have been instrumental in breaking the rather serious drouth which had been existing over western Japan. Two other storms of this region, which originated during the last days of May disappeared on the 1st or 2d of June near the 150th meridian, giving reported gales of force 7.

Of the storms of continental origin enumerated in the foregoing, that which passed out to sea to the northward of Formosa on the 6th, gave moderate to whole gales, especially on the 7th and 8th. The American steamer *Nanking*, Capt. T. H. Dobson, Observer E. J. Anderson, reports the following:

June 8th, 2 a. m.: Lat. 34° 50′ N., long. 142° 30′ E., fresh ENE. wind, overcast, heavy wind and rain squalls, horizon hazy. Wind increased steadily, so by noon it was blowing force 9. Raining very hard, horizon very hazy. Wind hauling around to NE. 4 p. m.: Lat. 34° 50′ N., long. 144° E.; barometer reading 29.23; wind north, force 9; raining hard, with very heavy wind and rain squalls. 12 midnight: Lat. 34° 25′ N., long. 145° 48′ E.; wind NW., 7; bar. 29.39; sea rough; partly cloudy; passing heavy wind and rain squalls. [correction of −0.19 applied to barometer readings.]

Another depression, but of little known intensity appeared over the Japanese Archipelago about the 24th. On the 26th and 27th gales of force 7 to 9 were reported by two steamships from between latitudes 40° and 45° N., longitudes 160° and 165° E., with pressure as low as 29.37 inches. The relation between this depression and the one noted to the westward on the 24th is obscure.

The American S. S. *Victoria*, Capt. C. S. Davis, Observer M. C. Reaber, Seattle to Nome, while near 57° N., 167° W., on the 11th reported occasional snow squalls. On the 12th the observer states: "Ship in heavy floe ice at 1 a. m., lat. 62° 02′ N., long. 167° 59′ W. No ice north of 62° 30′ N."

THE MANILA TYPHOON OF MAY 23, 1922.

By Rev. JOSE CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

The first typhoon of the season traversed the central part of the Philippines in a northwesterly direction on May 20 to 23, the center having passed practically over Manila in the morning of the 23d. Fortunately for the city, however, the typhoon was here very abnormal, as the winds were not very strong, even the barometer was rising rapidly after the passing of the vortex. Hence Manila missed the worst of the storm, and although the barometric minimum in the present case, 742.3 mm. (29.22 inches), was somewhat lower than in the two previous typhoons of August 31, 1920, and July 4, 1921, yet the damage done was much smaller, the maximum velocity of the wind, even in a few isolated gusts, having not been higher than 60 miles per hour.

The center, as just stated, passed practically over Manila, though a little to the west, as was shown by winds veering very rapidly (less than two hours) from NNW. and N. to the E. and S. and by the relative calm, which was clearly observed for about 23 minutes, from 8:01 to 8:24 a. m.

Our weather map for 2 p. m. of the 19th showed the typhoon over the Pacific about 200 miles to the east of Mindanao. The center passed near Surigao to the north between 5 and 6 p. m. of the 20th, and at 6 a. m. of the 21st it was situated over the northernmost part of Cebu Island near 124° longitude E. and 11° latitude N., moving approximately to NW. by W. The typhoon was headed for Mindoro, but a slight inclination of the track to the north caused it to go from Romblon to Marinduque and from Marinduque to Manila. After striking Manila, however, it took again the former direction to NW. by W., thus entering the China Sea near and to the south of Iba.

The following are the most important barometric minima recorded in the Philippines in this typhoon:

Place.	Date.	Hour.	Pressure.	
			Mm.	*Inches.*
Surigao	20	5:45 p. m.	744.95	29.33
Maasin, Leyte	20	10:50 p. m.	746.90	29.41
Romblon	22	9–10 a. m.	746.90	29.41
Boac, Marinduque	22	8:30 p. m.	741.90	29.21
Lucena, Tayabas	23	1:15 a. m.	747.70	29.44
Sta. Cruz, Laguna	23	4:50 a. m.	746.10	29.37
Manila	23	8:20 a. m.	742.30	29.22
Iba	23	3:00 p. m.	747.29	29.42

While the rate of progress of the typhoon between Surigao and Maasin was 8 or 9 miles per hour, it decreased later to such an extent that from Romblon to Boac the storm moved at the rate of only 5.6 miles per hour. When nearing Manila it increased again to about 8 miles per hour and from Manila to Iba the rate of progress was even greater than 10 miles per hour.

According to the observations at hand it would seem that the typhoon filled up on the 26th in the China Sea off Hainan.

Besides this Manila typhoon there was only one other shown by our weather maps during this month in the whole Far East. It appeared south of Guam on May 2, not far from 145° longitude E. and 10° latitude N. and moved northwestward between Guam and Yap.